

WHAT IS CLAIMED IS:

1. A method for maintaining synchronization in a communication system wherein a central entity transmits a signal containing timing information to one or more remote devices, the one or more remote devices using the timing information for scheduling transmissions, the method comprising:

receiving a first signal from the central entity and generating a symbol clock based on timing information included in the first signal;

upon termination of reception of the first signal, maintaining the symbol clock;

receiving a second signal from the central entity;

determining a symbol clock offset between the first signal and the second signal using the maintained symbol clock; and

adjusting the maintained symbol clock based on the symbol clock offset to provide an adjusted symbol clock.

2. The method of claim 1, further comprising:

providing the adjusted symbol clock to a transmitter.

3. The method of claim 1, further comprising:

detecting a loss of the first signal prior to receiving the second signal;

wherein determining the symbol clock offset using the maintained symbol clock comprises incrementing a counter based on the maintained symbol clock during the time period between the loss of the first signal and receipt of the second signal.

4. The method of claim 1, wherein determining the symbol clock offset using the maintained symbol clock comprises identifying a symbol clock offset necessary to obtain a valid alignment for forward error correction (FEC) decoding of the data in the second signal.

5. The method of claim 1, wherein determining the symbol clock offset using the maintained symbol clock comprises identifying a symbol clock offset necessary to obtain a valid puncture alignment for Trellis Coded Modulation (TCM) decoding of the data in the second signal.
6. The method of claim 1, wherein determining the symbol clock offset using the maintained symbol clock comprises identifying a symbol clock offset necessary to obtain a valid frame alignment for Reed-Solomon decoding of the data in the second signal.
7. The method of claim 1, wherein determining the symbol clock offset using the maintained symbol clock comprises:
  - identifying a first symbol clock offset necessary to obtain a valid puncture alignment for Trellis Coded Modulation (TCM) decoding of first encoded data in the second signal;
  - identifying a second symbol clock offset necessary to obtain a valid frame alignment for Reed-Solomon decoding of second encoded data in the second signal; and
  - combining the first symbol clock offset and the second symbol clock offset to generate a combined symbol clock offset.
8. The method of claim 1, further comprising:
  - receiving calibration information from the central entity relating to a difference in forward error correction (FEC) alignment between the first and second signals prior to receiving the second signal;  
wherein determining the symbol clock offset includes accounting for the difference in FEC alignment between the first and second signals.
9. The method of claim 1, further comprising:
  - receiving a notification message from the central entity indicating that the first signal will be terminated;

wherein determining the symbol clock offset is performed responsive to receiving the notification message and receiving the second signal.

10. A method for maintaining synchronization in a communication system wherein a central entity transmits a signal containing timing information to one or more remote devices, the one or more remote devices using the timing information for scheduling transmissions, the method comprising:

receiving a signal from the central entity;

generating a symbol clock based on timing information included in the signal;

storing information associated with the timing information to provide delayed timing information; and

upon termination of reception of the signal, accessing the delayed timing information to maintain the symbol clock.

11. The method of claim 10, wherein storing the information associated with the timing information includes storing the information for a predetermined period of time.

12. The method of claim 10, wherein accessing the delayed timing information includes accessing the delayed timing information representative of a time period immediately before the termination of the reception of the signal.

13. The method of claim 10, wherein accessing the delayed timing information includes accessing the delayed timing information representative of a time period ending at least one clock cycle before the termination of the reception of the signal.

14. The method of claim 10, wherein storing information associated with the timing information includes storing the information received from at least

one of a loop filter, a numerically controlled oscillator, and a voltage controlled oscillator.

15. The method of claim 10, further including analyzing the information associated with the timing information to determine when the termination of the reception of the signal occurs.

16. An apparatus in a communication system, the apparatus comprising:  
a receiver adapted to receive a first signal and a second signal from a central entity;

a clock generation element adapted to generate a symbol clock based on timing information included in the first signal and to maintain the symbol clock upon termination of reception of the first signal;

an offset determination element adapted to determine a symbol clock offset between the first signal and the second signal using the maintained symbol clock; and

an upstream timing element to adjust the maintained symbol clock based on the symbol clock offset to provide an adjusted symbol clock.

17. The apparatus of claim 16 further including a transmitter adapted to receive the adjusted symbol clock.

18. The apparatus of claim 16 further including a loss detection element adapted to detect a loss of the first signal prior to the receiver receiving the second signal, and wherein the offset determination element includes a counter that is incremented based on the maintained symbol clock during the time period between the loss detection element detecting the loss of the first signal and the receiver receiving the second signal.

19. The apparatus of claim 16, wherein the offset determination element identifies a symbol clock offset necessary to obtain a valid alignment for forward error correction (FEC) decoding of the data in the second signal.
20. The apparatus of claim 16, wherein the offset determination element identifies a symbol clock offset necessary to obtain a valid puncture alignment for Trellis Coded Modulation (TCM) decoding of the data in the second signal.
21. The apparatus of claim 16, wherein the offset determination element identifies a symbol clock offset necessary to obtain a valid frame alignment for Reed-Solomon decoding of the data in the second signal.
22. The apparatus of claim 16, wherein the offset determination element identifies a first symbol clock offset necessary to obtain a valid puncture alignment for Trellis Coded Modulation (TCM) decoding of first encoded data in the second signal, identifies a second symbol clock offset necessary to obtain a valid frame alignment for Reed-Solomon decoding of second encoded data in the second signal, and combines the first symbol clock offset and the second symbol clock offset to generate a combined symbol clock offset.
23. The apparatus of claim 16, wherein the receiver receives calibration information from the central entity relating to a difference in forward error correction (FEC) alignment between the first signal and the second signal prior to receiving the second signal, and the symbol clock offset is based on the difference in FEC alignment between the first signal and the second signal.
24. The apparatus of claim 16, wherein the offset determination element determines the symbol clock offset in response to the receiver receiving the second signal and a notification message from the central entity, and the notification message indicates that the first signal will be terminated.

25. The apparatus of claim 16, wherein the apparatus is a cable modem.
26. An apparatus in a communication system, the apparatus comprising:
  - means for receiving a signal from a central entity;
  - means for generating a symbol clock based on timing information included in the signal;
  - means for storing information associated with the timing information to provide delayed timing information; and
  - means for accessing the delayed timing information upon termination of reception of the signal to maintain the symbol clock.
27. The apparatus of claim 26, wherein the means for storing the information store the information for a predetermined period of time.
28. The apparatus of claim 26, wherein the delayed timing information is representative of a time period immediately before the termination of the reception of the signal.
29. The apparatus of claim 26, wherein the delayed timing information is representative of a time period ending at least one clock cycle before the termination of the reception of the signal.
30. The apparatus of claim 26, wherein the means for storing information store the information received from at least one of a loop filter, a numerically controlled oscillator, and a voltage controlled oscillator.
31. The apparatus of claim 26, further including means for analyzing the information associated with the timing information to determine when the termination of the reception of the signal occurs.

32. The apparatus of claim 26, wherein the apparatus is a cable modem.